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years. The first edition (1901) was at once accorded its rightful place at the head of the list of our meteorological text-books. No other book approached it as a complete, systematic, masterful discussion of the whole range of meteorological phenomena. The well-arranged and carefully selected bibliography alone was worth the cost of the entire volume. In 1906 came the second edition, in which the author introduced certain changes intended to make the "Lehrbuch" somewhat more popular, using that term in the best sense. The number of pages was reduced by 150; some of the less important details were omitted, and considerable reduction was made in the bibliographic notes. In this form the book, embodying all the noteworthy additions to meteorological knowledge which had been made during the years 1901–1906, became a most valued text and reference book to an increased number of readers.

To the great satisfaction of all workers in meteorological science, Professor von Hann has found opportunity, in the midst of his many other activities, and in spite of his advancing years, to revise his "Lehrbuch" once more, this time with the cooperation of Professor Süring. What we noted, in these columns, in regard to the first edition of this remarkable work is true, with added emphasis, of the latest issue. The general plan of the original edition has again been followed, in that the book has been increased in size, and the bibliographic notes, which were much reduced in the 1906 edition, have been restored, extended and brought down to date. For the purposes of the working meteorologist the new edition naturally has a greater value than the second, excellent as the latter was. No one can read over the new "Lehrbuch" without being profoundly impressed by the author's extraordinarily complete grasp of the whole range of meteorological literature. Everything is discussed in the light of the latest information which we have, and everywhere we see the touch of the master-hand, in the clean-cut, well-balanced and thoroughly digested discussions. Thorough as the treatment is, with marked emphasis upon the physical aspects of all the phenomena, the reader who is unfamiliar with mathematical analysis will not find the volume difficult to study. For, following the excellent plan already adopted in the first edition, the more technical mathematical and physical sections are included in an appendix. Special attention has been paid to the latest results of the aerological investigations which have become so important a branch of modern meteorology. The chapters on aerology, on clouds and on atmospheric electricity were prepared by Professor Süring, who is peculiarly competent to deal with these subjects.

Two of the matters concerning which meteorologists, as a whole, are still uncertain are the general circulation of the atmosphere and the theory of cyclones and anticyclones. Probably many readers of the "Lehrbuch" will turn at once to the discussion of these matters, in the hope that they may clear up their own minds on these debated topics. A reading of the sections in which these subjects are considered shows very clearly the gaps in our present knowledge of the facts, and the difficulty of giving satisfactory explanations under these circumstances. The case is stated clearly in the light of our present knowledge, but it is not a closed case.

Meteorologists will find, in the new edition of the "Lehrbuch der Meteorologie," their one absolutely indispensable reference book. Their colleagues, workers in other branches of science, will inevitably refer to this volume for the information which they may need to help them in their own investigations. Thus von Hann's "Lehrbuch" stands as the master-work on the science of the earth's atmosphere.

R. DeC. Ward

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Die physikalische Chemie der Proteine. By Dr. T. Brailsford Robertson, professor of physiological chemistry and pharmacology in the University of California. Translated by F. A. Wyncken. Dresden, Verlag von Theodor Steinkopff. 1912. Pp. 447.

This book is a careful compilation of inves-

tigations relating to physical constants and properties of proteins. This line of study, as the author remarks, certainly deserves consideration on the part of chemists and biologists, although it is not yet satisfactorily developed. The book is divided into four parts: (1) chemical statics in protein systems (dealing with preparations of pure proteins and hypotheses concerning protein compounds); (2) electrochemistry of proteins (conductivity, etc); (3) physical properties of protein systems; (4) chemical dynamics in protein systems (hydrolysis of proteins, action of enzymes). Naturally the author's own investigations are discussed at length. In these he tries to apply those quantitative laws which, as a rule, are classified specifically as physicochemical: the gas laws, van't Hoff's theory of dilute solutions and all those other laws which can be derived from them on the basis of thermodynamics. The numerical data of the measurements fit the calculations well in most cases; the conclusion of the author, however, that protein solutions do not contain discrete particles does not seem perfectly justified, since investigations by Einstein and by Perrin have shown that even emulsions allow the application of the gas law in a certain form. Nevertheless the book will certainly prove extremely useful as a manual for all those who are interested in the further development of this important branch of science.

R. BEUTNER

Die Vorzeitlichen Säugetiere. By O. ABEL. Jena, Gustave Fischer, 1914. Pp. v + 309, with 250 figures and 2 tables in the text.

In the introduction the author emphasizes the dominance during the Mesozoic of the great reptiles—dinosaurs on land, mosasaurs in the sea, pterosaurs in the air—which, though mammals, had existed from the Upper Trias to the limit of the Cretaceous, put an effective check upon their evolutionary advancement. The principal abiding place of the mammals has always been the continents, yet by Middle Eocene time one finds the sea mammals, such as the whales and Sirenia, already evolved, and although the aerial realm has never been a domain of the mammals, the bats have for a long time competed with the birds, the heirs of the pterosaurs.

According to Steinmann, the different reptilian stems were not extinguished at the end of the Cretaceous period, but the great dinosaurs are said to have still existed in the great land mammals of the Tertiary, the ichthyosaurs in the dolphins, the mosasaurs in the baleen whales, the plesiosaurs in the sperm whales, the pterodactyls in the bats. This view Abel refutes upon anatomical and other grounds, and derives the mammals from a much more primitive reptilian stock. The author discusses the remarkable preservation of fossil mammals, as seen in the asphalt beds of the Rancho La Brea in California, frozen cadavers in the tundras of Siberia and those preserved in the oil-steeped soil of Galicia and the dry caverns of Patagonia, as well as in the ordinary mineralization of the bones. The principal localities which have produced mammalian remains are recorded; first those of the Mesozoic, then the European localities in their geologic sequence, followed by those of Asia, Africa, North America, South America and Australia in the order named. A very carefully wrought out chronological table is given, correlating the faunas of the five continental regions, the North American column presenting the six successive faunal phases as originally proposed by Osborn.

The oldest mammalian remains are discussed, no Permian ones being known, but the Upper Trias producing forms which seem to point to an origin at the latest by Permian time. The position of the ancient mammals in the "system" of living mammals is next dealt with historically. Abel recognizes the difficulty of erecting a system of classification which shall also give the phylogenetic stages in the history of any stock, and states that it almost seems as if it were impossible, on the basis of our present taxonomy, to form a satisfactory compromise between that and phylogeny. His own classification, though in many cases it does not give full recognition to phylogenetic facts, seeks, where possible, to lay emphasis on the historic and genetic